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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/560,268	04/26/2000	Whonchee Lee	150.0056 0102	2517

7590 10/22/2003

Attn Mark J Gebhardt
Mueting Raasch Gebhardt PA
PO Box 581415
Minneapolis, MN 55458-1415

EXAMINER

DEO, DUY VU NGUYEN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 10/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/560,268

Applicant(s)

LEE ET AL.

Examiner

DuyVu n Deo

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 August 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 64,65,67-76,89,90 and 92-95 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 64,65,67-76,89,90 and 92-95 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 64, 65, 67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakano (US 6,110,839), Shiramizu (US 6,116,254), and Wei (US 4,350,564).

Nakano teaches a solution (claimed etching composition) comprising: HCl (claimed mineral acid), H₂O₂ (claimed peroxide), and water with their respective ratio of 1:1:10 (col. 6, line 39-44). Unlike claimed invention, Nakano is silent about using DI water; however, using DI or pure water to prepare similar chemical bath is well known to one skilled in the art as shown by Shiramizu (col. 1, line 32), and would have been obvious so that the chemical bath doesn't contain other contamination.

Unlike claimed invention, Nakano doesn't describe the HCl:H₂O₂:water concentration is at 1:1:25-1:1:15 respectively. However, chemical concentration is a result-effective variable as shown here by Wei (col. 4, line 34, 35). Therefore, it would have been obvious for one skill in the art to determine the chemical composition through test run in order to obtain optimum chemical concentration to provide a solution to remove metal impurities with a reasonable expectation of success. See also *In re Boesch*, 617, F.2d 272, 205 USPQ 215 (CCPA 1980).

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3. Claims 68-76, 89, 90, 92-95 rejected under 35 U.S.C. 103(a) as being unpatentable over Nakano, Shiramizu, and Wei and further in view of Vanell et al. (US 5,945,346).

Referring to claims 68, 72, 73, 77, 79, 84, 89, Nakano doesn't describe the etching solution having an etch rate greater than 1000A/min and an etch rate for metal nitride at about 50-250 A/min at a T range of 20-100 degrees Celsius. However, Nakano describes his solution remove metal impurities (col. 3, line 11-17). Therefore, his solution would be obviously can be used for etching metal since etching is also removing metal, including cobalt and metal nitride. Also, the chemical concentration is a result-effective variable (please see Wei above) and chemical reactions of a solution are sensitive to temperature as shown here by Vanell (col. 9, line 35-37); therefore, it would have been obvious for one skill in the art at the time of the invention to determine the optimum or workable range of these variable through routine experimentation for the etching or removal of metal with a reasonable expectation of success. See also *In re Boesch*, 617, F.2d 272, 205 USPQ 215 (CCPA 1980).

Referring to claim 94, unlike claimed invention, Nakano doesn't describe HCl and H₂O₂ being used have a concentration of 37 wt% and 29 wt% respectively. However, he teaches HCl and H₂O₂ having concentration of 36 wt% and 30 wt% respectively. These concentration would essentially is the same as claimed concentration. It would have been obvious at the time of the invention for one skilled in the art that the final concentration being used would depend on the desired etch rate and material being etched; therefore, one skilled in the art would determine the chemical concentration through test run in order to obtain the optimum chemical concentration for the etching with a reasonable expectation of success. See also *In re Boesch*, 617, F.2d 272, 205 USPQ 215 (CCPA 1980).

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Response to Arguments

4. Applicant's arguments with respect to claims 64, 65, 67-76, 89, 90, 92-95 have been considered but are moot in view of the new ground(s) of rejection.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DuyVu n Deo whose telephone number is 703-305-0515.

DVD
10/14/03

A handwritten signature in black ink, appearing to be 'DVD' or similar, located below the typed name and date.